

A<sup>2</sup>  
higher harmonics.

A<sup>3</sup>  
5. (amended) Apparatus as claimed in claim 1 wherein said processing means recognises that whilst the natural resonance frequencies of stems and logs may be far from harmonic (principally on account of the asymmetry introduced by their taper or loading eg; when stacked) they may be transformed to a harmonic series by applying a correction which decreases as the harmonic number increases.

A<sup>4</sup>  
8. (amended) Apparatus as claimed in claim 6 wherein the relationship is  $f_n/nf_0 - 1 = k/n^2$ .

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9. (amended) Apparatus as claimed in claim 1 wherein said processing means discriminates against noise spikes in the spectra, peaks from unwanted modes inadvertently excited, or any other signals which differ from the spectral peaks sought and which have the desired relationship by using a comb filter comprising a number of frequencies ("centre" frequencies) which match the sought relationship, which can themselves be harmonic or have some other relationship, the comb filter having passbands wide enough to allow small deviations about each centre frequency, forming the sum of the products of the actual spectral peaks and the comb filter, and identifying as the sequence or filter which accounts for most spectral power, and, where necessary, deciding between two filters which produce equal power sums on the basis of the comb which produces the least frequency offset between the actual spectral peaks and the filter centre frequencies.

10. (amended) Apparatus as claimed in claim 6 wherein said

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processing means uses such transforms to convert a harmonic series with a defined base frequency  $f_0$  to a non-harmonic series, thereby defining the centre frequencies of a comb filter with which the actual series may be compared, without the need for all members of the actual series to be present.

11. (amended) Apparatus as claimed in claim 1 wherein said processing means can calculate a confidence number to be displayed by said display means to indicate the likelihood that the indicated velocity is correct or whether a re-measure is advisable based on the amount of power in the spectral peak series identified with a base value of  $f_{0s}$  compared with spectral power not accounted for, e.g. that assumed to be in spurious noise spikes or non-longitudinal resonances inadvertently excited.

12. (amended) Apparatus of claim 1 wherein said indicator is  $V$  or  $V^2$  or a function of  $V$  or a function of  $V^2$ .

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15. (amended) Apparatus of claim 1 wherein said sensing means and/or processing means includes amplification means to ensure a sufficient gain to ensuing echos in use.

16. (amended) Apparatus of claim 1 wherein said sensing means is adapted to be placed in contact with a said log end.

17. (amended) Apparatus of claim 1 wherein said sensing means carries a switch for said processing means conducive, when activated, of good log/sensing means contact.

18. (amended) Apparatus as claimed in claim 1 wherein said sensing

AS means is compliantly mounted by a sensing head to be physically pressed by a user against the log surface to be tested.

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AP 20. (amended) Apparatus as claimed in claim 18 wherein said sensing means is in a sensing head connected by flexible means to apparatus carrying said processing means and said display means.

21. (amended) Apparatus as claimed in claim 1 wherein said sensing means is or includes a piezo-style accelerometer.

22. (amended) Apparatus as claimed in claim 1 wherein said processing means has analog signal acquisition means, means for digitization and processing into a characteristic spectrum of the acquired analog signal data of the echoes and further software algorithms to interpret the data.

23. (amended) Apparatus of claim 1 wherein, with a view to power saving, said display means is small low power display.

24. (amended) Apparatus of claim 1 wherein said sensing means is in a sensing head capable of one handed manipulation by user and whereby the apparatus is adapted to minimise power consumption by allowing initiation of the measurement sequence by finger pressure on a push switch immediately prior to the striking of a log to be tested, such pressure on such a push switch encouraging positive contact between the head and the log surface.

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25. (amended) Apparatus as claimed in claim 1 wherein said processing means is adapted to threshold the signal from said sensing means and immediately to apply an exponentially increasing

Amplification of the signal to compensate for absorption of the signal in the log so increasing the time over which acoustic signals can be usefully digitalised and to increase spectral resolution.

26. (amended) Apparatus as claimed in claim 1 in which power consumption is adapted to be minimised by allowing operation under the control of PLDs which remain in low current mode until enabled by an initiation switch after which there is a powering up, at least as needed, of analogue functions of said processing means with respect to signal acquisition, powering up and analysis of such signals and a sending results to the display means before being subsequently powered down after a time period or time periods.

27. (amended) Apparatus as claimed in claim 1 wherein there is provided a keyboard through which data entries can be made into said processing means.

29. (amended) Apparatus as claimed in claim 1 having a hardware architecture substantially as hereinbefore described with reference to the accompanying drawings and which is operable in a manner substantially as hereinbefore described with reference to any one or more of the accompanying drawings.

30. (amended) Apparatus of claim 1 wherein said sensing means is adapted to be placed at or in close proximity to the same log end as that to be struck to provide said impulse.

31. (amended) A method of providing as indicator of or from which

A2 stiffness, fibre characteristics or other properties can be estimated, which method involves an operative use of apparatus as claimed in claim 1.

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A8 35. (amended) The use of apparatus as claimed in claim 1 for use in a method of providing as indicator of or from which stiffness, fibre characteristics or other properties can be estimated.

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A9 38. (amended) A method of claim 31 wherein said same end is stuck.

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Please cancel claims 32, 39 and 41 without prejudice or disclaimer.

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